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Facility Deactivation and Decommissioning at the Savannah River Site

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Introduction

In February 2002, the U.S. Department of Energy initiated actions to expedite Cleanup, focus on significant and early risk reduction, and reduce costs at the Savannah River Site (SRS). In response SRS started on a project focused on completing the decommissioning of inactive facilities in T, D, and M Areas, areas that on the perimeter of the Site, by the end of 2006.

In June 2003, the Department of Energy Savannah River Operations Office (DOE-SR), the South Carolina Department of Health and Environmental Control (SCDHEC), and the Environmental Protection Agency, Region 4 (EPA-4) endorsed a Memorandum of Agreement (MOA) concerning cleanup at the Savannah River Site (SRS). The vision of the Agreement is that SRS will reduce its operations footprint to establish a buffer zone at the perimeter if the Site, while the central core area of the Site will be reserved for continuing or future long-term operations. DOE-SR, EPA-4, and SCDHEC agreed that establishing this buffer zone and appropriately sequencing environmental restoration and decommissioning activities can lead to greater efficiency and accelerate completion of entire site areas. This vision is embodied in the concept of Area Completion – which integrated operations, deactivation and decommissioning (D&D), and soils and groundwater cleanup into a time-phased approach to completing all the work necessary to address the Cold War legacy. D&D addresses the "footprint" of the building or structure, while the soils and groundwater project addresses any environmental remediation that may be required in the underlying and surrounding soils and groundwater. Since then, ~250 facilities have been decommissioned at the SRS, ranging from guard stations to nuclear fuel production facilities.

Work Description

In September 2003, SRS published the Savannah River Site Environmental Management Integrated Deactivation and Decommissioning Plan to support the Area Completion effort. This comprehensive plan addressed the final disposition and physical end state of all Environmental Management facilities throughout the SRS and provided a preliminary planning schedule that would complete all D&D activities by the end of FY2025. The D&D project defined in this plan encompassed 1,013 facilities. DOE-SR initiated a modification that added 247 of these facilities to the SRS contract to be decommissioned by the end of FY2006. The facilities added were from most areas on the Site but concentrated in the perimeter areas (See Table 1).

Table 1 – D&D Scope by Area

Area	Description	# of Facilities
A	Administrative/Research	44
C	C Reactor Complex	6
D	Heavy Water Production	35
E	Waste Burial Ground	3
F	Separations	48
G	General Site	7
H	Separations	2
K	K Reactor Complex	7
L	L Reactor Complex	10
M	Fuel Fabrication	22
N	Central Shops	9
P	P Reactor Complex	19
R	R Reactor Complex	7
T	Test and Laboratory	28
TOTAL		**247**

The June 2003 MOA established a graded approach to decommissioning based on facility hazards, contaminants, complexity, and regulatory agreements. For each facility a Facility Decommissioning Evaluation (FDE) was prepared to determine which "model" would be used to decommission the facility. There are three models to consider; Simple Model, Integrated Sampling Model, and Engineering Evaluation/Cost Analysis (EE/CA) Model. The FDE was submitted to DOE-SR, EPA, and SCDHEC for review and concurrence on the selected model.

The simplest decommissioning actions, such as guard houses or office buildings are identified as Simple Model facilities. For these facilities, the public is notified of DOE-SR's plans through briefings at CAB meetings. Formal public comment is not sought. Regulatory involvement includes review and concurrence on the Facility Decommissioning Evaluation. Representatives for SCDHEC and EPA-4 review the documentation and may conduct a field walk-down of the facility before making their determination.

The next level of complexity, the Integrated Sample Model, is applied to facilities that may have been exposed to chemical or radiological contamination due to its operational history. This model requires characterization to determine if contamination is present in the foundation and if cleanup is needed. The FDE includes a description of the processes conducted in the facility and a listing of contaminants of concern (COC). Representatives for SCDHEC and EPA-4 review the documentation and conduct a field walk-down of the facility before making their determination. During the walk-down the regulators have the opportunity to request additional sampling locations and/or sampling for additional COCs.

Facilities with the highest level of complexity are decommissioned as Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) non-time critical removal actions. This process involves development of an Engineering Evaluation/Cost Analysis (EE/CA), conducting a formal public comment period, and documenting the removal action in a Removal Action Memorandum. The EE/CA provides the framework for evaluating alternative decommissioning actions. It identifies the objectives of the decommissioning action and analyzes the effectiveness, implementability, and costs of various alternatives. The EE/CA is made available for formal public review and comment for 30 days. A notice of availability is published in local newspapers and in the SRS Environmental Bulletin. An overview presentation on the contents of the EE/CA is also given to the Citizens Advisory Board's Facility Disposition and Site Remediation Committee at the beginning of the review period.

Since the MOA was signed, DOE-SR decided that certain facilities, especially the primary nuclear production facilities such as the canyons and reactors, will be decommissioned as CERCLA remedial actions to ensure even greater regulatory and public participation. This decision also satisfies concerns expressed through the SRS CAB in their Recommendation 215, which questioned whether the CERCLA removal action process was adequate for a complex facility such as a canyon. The first facility at SRS to be decommissioned as a CERCLA Remedial Action will be P-Reactor.

Results

As of November 30, 2006, SRS completed the decommissioning of 247 facilities using the graded approach described above. Table 2 shows the distribution of these facilities across the available decommissioning models.

Table 2 – Completed D&D

D&D Model Type	# of Facilities	% of Total
Simple	178	72%
Integrated Sampling	68	27%
EE/CA	1[i]	<1%
TOTAL	**247**	

Conclusions and Discussions

The efforts made up front to develop the MOA and maintain open and active involvement with the EPA and SCDHEC was instrumental to the success of the SRS D&D Project. Accelerated D&D requires innovative regulatory approaches so that time and resources

are spent commensurate with the hazards of the facilities being decommissioned. The graded approach developed at SRS accomplished a balance between building hazards and the amount of regulatory and public involvement.

[i] The EE/CA model was chosen for the decommissioning of three facilities. As of the time of the preparation of this paper, 1 facility was completed, work was ongoing on a second, and decommissioning of the third facility has been postponed.